

**APPARATUS AND METHOD FOR ENCODING AND COMPUTING
DISCRETE COSINE TRANSFORMS USING A BUTTERFLY PROCESSOR**

ABSTRACT OF THE DISCLOSURE

[0101] An apparatus to determine a transform of a block of encoded data the block of encoded data comprising a plurality of data elements. An input register is configured to receive a predetermined quantity of data elements. At least one butterfly processor is coupled to the input register and is configured to perform at least one mathematical operation on selected pairs of data elements to produce an output of processed data elements. At least one intermediate register is coupled to the butterfly processor and configured to temporarily store the processed data. A feedback loop is coupled to the intermediate register and the butterfly processor, and where if enabled, is configured to transfer a first portion of processed data elements to the appropriate butterfly processor to perform additional mathematical operations and where if disabled, is configured to transfer a second portion of processed data elements to at least one holding register.

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